What is claimed is:

1. A nucleic acid extraction solution comprising a molecule in an amount sufficient to extract nucleic acids from a biological sample, the molecule having the formula $R_1O\text{-}CH_2\text{-}CH_2\text{-}OR_2$, wherein R_1 and R_2 independently are selected from the group consisting of hydrogen and an alkyl group.

2. The solution of claim 1, wherein the alkyl group has 1-6 carbon atoms.

3. The solution of claim 2, wherein the alkyl group is selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl, sec-butyl, tert-butyl, n-pentyl, iso-pentyl, n-hexyl, and iso-hexyl.

4. The solution of claim 2, wherein the alkyl group is selected from the group consisting of methyl, ethyl, n-butyl, iso-butyl, sec-butyl, and tert-butyl.

5. The solution of claim 1, wherein R_1 is methyl, ethyl, n-butyl, iso-butyl, sec-butyl, or tert-butyl and R_2 is hydrogen.

6. The solution of claim 1, wherein the molecule is selected from the group consisting of 2-methoxyethanol, 2-ethoxyethanol, and 2-n-butyloxyethanol.

7. The solution of claim 1, wherein the molecule is 2-methoxyethanol.

8. The solution of claim 1, wherein the solution comprises from about 0.5% (v/v) to about 5% (v/v) of the molecule.

9. The solution of claim 8, wherein the solution comprises about 1% (v/v) of the molecule.

10. The solution of claim 1, further comprising a buffering agent.

11. The solution of claim 10, wherein the buffering agent is selected from the group consisting of a Tris buffer, a MOPS buffer, and a borate buffer.

12. The solution of claim 1 or 10, wherein the solution has a pH greater than about 7.

13. The solution of claim 12, wherein the pH is greater than about 7 and less than about 13.

14. The solution of claim 1 or 10 further comprising a detergent.

15. The solution of claim 14, wherein the detergent is selected from the group consisting of Tween®, Brij®, and Triton®-X100.

16. A method of extracting nucleic acid from a biological sample, the method comprising:

mixing the sample with a solution comprising a molecule having the formula R_1O-CH_2-CH_2-OR_2, wherein R_1 and R_2 independently are selected from the group consisting of hydrogen and an alkyl group, so that nucleic acid is released from cells or cellular debris in the sample.

17. The method of claim 16, wherein the alkyl group has 1-6 carbon atoms.

18. The method of claim 17, wherein the alkyl group is selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl, sec-butyl, tert-butyl, n-pentyl, iso-pentyl, n-hexyl, and iso-hexyl.

19. The method of claim 17, wherein the alkyl group is selected from the group consisting of methyl, ethyl, n-butyl, iso-butyl, sec-butyl, and tert-butyl.

20. The method of claim 16, wherein R_1 is methyl, ethyl, n-butyl, iso-butyl, sec-butyl, or tert-butyl and R_2 is hydrogen.

21 The method of claim 16, wherein the molecule is 2-methoxyethanol.

22. The method of claim 16, wherein the solution further comprises a buffering agent.

23. The method of claim 22, wherein the buffering agent is selected from the group consisting of a Tris buffer, a MOPS buffer, and a borate buffer.

24. The method of claim 16 or 22, wherein the solution has a pH greater than about 7.

25. The method of claim 24, wherein the pH is greater than about 7 and less than about 13.

26. The method of claim 16 comprising the additional step of heating the mixture to a temperature within the range of from about 50°C to about 100°C.

27. The method of claim 26, comprising heating the mixture to a temperature of from about 75°C to about 100°C.

28. The method of claim 27, comprising heating the mixture to a temperature of from about 90°C to about 100°C.

29. The method of claim 16, wherein the solution comprises about 1% 2-methoxyethanol and borate buffer, pH 9.5.

30 The method of claim 16, comprising the additional step of amplifying a nucleic acid sequence extracted from the sample.

31. The method of claim 16, comprising the additional step of detecting a nucleic acid sequence extracted from the sample.

32. The method of claim 30, wherein the amplification step uses a pair of amplification primers comprising the sequences of SEQ ID NOS: 4 and 5.

33. The method of claim 32, comprising the additional step of detecting the presence of the nucleic acid sequence with a probe comprising the sequence of SEQ ID NO: 3.

34. The method of claim 30, wherein the amplification step uses a pair of amplification primers comprising the sequences of SEQ ID NOS: 8 and 9.

35. The method of claim 34, comprising the additional step of detecting the presence of nucleic acid sequence a probe comprising the sequence of SEQ ID NO: 10.

36. The method of claim 16, wherein the method lacks a chloroform extraction step, a phenol extraction step, a phenol/chloroform extraction step, or an alcohol precipitation step.

37. The method of claim 16, wherein the nucleic acid is a bacterial or viral nucleic acid.

38. The method of claim 16, wherein the biological sample is harvested from a mammal.

39. The method of claim 38, wherein the biological sample comprises cervical cells or cell debris.

40. The method of claim 38, wherein the biological sample comprises breast cells or cell debris.